

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Currently Amended) A membrane electrode assembly (MEA)

comprising:

a) a composite membrane having a first major surface area and a second major surface area comprising:

1) a membrane layer comprising an ionically conductive solid and an ionomer binder;

2) at least one protective layer disposed adjacent to the membrane layer comprising an ~~an~~ ionically conductive solid and ionomer binder, and optionally hygroscopic fine powder;

b) an anode comprising an oxidizing catalyst adjacent said first major surface area of said composite membrane;

c) a cathode comprising a reducing catalyst adjacent said second major surface area of said composite membrane.

Claim 2. (Currently Amended) The MEA of Claim 1 wherein the ~~mebrane~~

membrane layer comprises a porous polymeric matrix.

Claim 3. (Original) The MEA of Claim 1 further comprising one or more collectors in contact with said anode and/or cathode.

Claim 4. (Original) The MEA of Claim 1 wherein the anode further comprises an ionomer binder.

Claim 5. (Original) The MEA of Claim 4 wherein the anode further comprises an ionically conductive solid.

Claim 6. (Original) The MEA of Claim 6 wherein the ionomer binder of the anode comprises a proton conducting ionomer.

Claim 7. (Original) The MEA of Claim 6 wherein the proton conducting ionomer of the anode is perfluorosulfonic acid.

Claim 8. (Original) The MEA of Claim 1 wherein the cathode further comprises an ionomer binder.

Claim 9. (Original) The MEA of Claim 8 wherein the cathode further comprises an ionically conductive solid.

Claim 10. (Original) The MEA of Claim 4 wherein the ionomer binder of the cathode comprises a proton conducting ionomer.

Claim 11. (Original) The MEA of Claim 10 wherein the proton conducting ionomer is perfluorosulfonic acid.

Claim 12. (Original) The MEA of Claim 1 wherein the ionomeric binder of the composite membrane is a proton conducting ionomer.

Claim 13. (Original) The MEA of Claim 12 wherein the proton conducting ionomer of the composite membrane is perfluorosulfonic acid.

Claim 14. (Currently amended) The MEA of Claim 4 wherein the ionomeric binder content of the anode is between about 10% to about 100% of the anode catalyst content by volume.

Claim 15. (Original) The MEA of Claim 8 wherein the ionomeric binder content of the cathode is between about 10% to about 100% of the cathode catalyst content by volume.

Claim 16. (Original) The MEA of Claim 1 wherein the oxidizing catalyst of the anode is supported on carbon particles.

Claim 17. (Original) The MEA of Claim 16 wherein the percentage of catalyst in the anode that is supported on carbon is 20% to 60% by weight.

Claim 18. (Original) The MEA of Claim 16 wherein the catalyst loading of the cathode is between 0.05 and 5 mg/cm² frontal area.

Claim 19. (Original) The MEA of Claim 1 wherein the reducing catalyst of the cathode is supported on carbon particles.

Claim 20. (Original) The MEA of Claim 19 wherein the percentage of catalyst in the cathode that is supported on carbon is 20% to 60% by weight.

Claim 21. (Original) The MEA of Claim 19 wherein the catalyst loading of the cathode is between 0.05 and 5 mg/cm² frontal area.

Claim 22. (Original) The MEA of Claim 1 wherein the ionically conductive solid of the cathode is a heteropoly acid.

Claim 23. (Original) The MEA of Claim 22 wherein the heteropoly acid is selected from the group consisting of: phosphotungstic acid, phosphomolybdic acid, and zirconium hydrogen phosphate.

Claim 24. (Original) The MEA of Claim 5 wherein the ionically conductive solid of the anode is a heteropoly acid.

Claim 25. (Original) The MEA of Claim 24 wherein the heteropoly of the anode is selected from the group consisting of: phosphotungstic acid, phosphomolybdic acid, and zirconium hydrogen phosphate.

Claim 26. (Original) The MEA of Claim 9 wherein the ionically conductive solid of the cathode is a heteropoly acid.

Claim 27. (Original) The MEA of Claim 26 wherein the heteropoly acid of the cathode is selected from the group consisting of: phosphotungstic acid, phosphomolybdic acid, and zirconium hydrogen phosphate.

Claim 28. (Original) The MEA of Claim 9 wherein the ionically conductive solid of the cathode is between 20% and 40% of the content of the ionomer by volume.

Claim 29. (Original) The MEA of Claim 5 wherein the ionically conductive solid of the anode is between 20% and 40% of the content of the ionomer by volume.

Claim 30. (Original) The MEA of Claim 3 wherein the one or more collectors in contact with said anode and/or cathode consists of a porous material.

Claim 31. (Original) A fuel cell comprising the MEA of Claim 1.

Claim 32. (Original) An electrolysis cell comprising the MEA of Claim 1.

Claim 33. (Original) A vehicle comprising the fuel cell of Claim 30.

Claim 34. (Original) An electromechanical system comprising the electrolysis cell of
Claim 32.

Claims 35-50 (canceled)